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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/703,631	11/02/2000	Alan F. Graves	1111967ROUS01U	1695

28291 7590 06/23/2004

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EXAMINER

LI, SHI K

ART UNIT

PAPER NUMBER

2633

8

DATE MAILED: 06/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/703,631

Applicant(s)

GRAVES, ALAN F.

Examiner

Shi K. Li

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 March 2004.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-16 and 18-38 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☒ Claim(s) 2-16, 18-26 and 35-36 is/are allowed.
6) ☒ Claim(s) 27-34 and 37 is/are rejected.
7) ☒ Claim(s) 38 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 37 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claim 37 recites the limitation "the first plurality of optical switching matrices" in lines 32-33 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 27-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Shiragaki (U.S. Patent 5,457,556).

Shiragaki discloses in FIG. 2 an optical switching system. FIG. 2 comprises a space switch 10 for switching a group of channels, a wavelength switch 13 for switching optical channels, a plurality of wavelength division demultiplexers 12-1 and 12-2 for ungrouping channels, and a plurality of wavelength division multiplexers 14-1 and 14-2 for grouping together optical channels. Shiragaki illustrates in FIG. 2 the space switch and wavelength switch

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as two logical separate entities. Note that the word "logical" recited in lines 2 and 3 of claim 27 does not carry any patentability weight because it is related to an abstract concept that is not tangible and, therefore, is not enforceable.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiragaki (U.S. Patent 5,457,556) in view of Kuwano (H. Kuwano, "MEMS for Telecommunication Systems", Seventh International Symposium on Micro Machine and Human Science, IEEE 1996) and Marxer et al. (C. Marxer, "MEMS for Applications in Fiber Optic Communication", IEEE 1998).

Shiragaki has been discussed above in regard to claims 27-28. The difference between Shiragaki and the claimed invention is that Shiragaki does not teach the use of MEMS. Marxer et al. teaches in FIG. 2 a four-port MEMS and Kuwano teaches in FIG. 2 a six-port MEMS. It is clear from Table 2 of Marxer et al. that MEMS switches are fast, low loss with little crosstalk. One of ordinary skill in the art would have been motivated to combine the teaching of Marxer et al. and Kuwano with the switching system of Shiragaki because MEMS switches are small and have desirable optical characteristics. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use MEMS switches, as taught by Marxer et al. and

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Kuwano, in the switching system of Shiragaki because MEMS switches are small and have desirable optical characteristics.

8. Claims 31-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiragaki (U.S. Patent 5,457,556) in view of Fatehi et al. (U.S. Patent 6,192,172 B1).

Shiragaki has been discussed above in regard to claims 27-28. Regarding claims 31-32, the difference between Shiragaki and the claimed invention is that Shiragaki does not teach a plurality of optical switches for the first layer. Fatehi et al. teaches in col. 4, lines 31-35 and FIG. 3 that a large-scale switch can be realized using a plurality of conventional optical WSCX. In fact, the switch 13 of Shiragaki consists of a plurality of smaller switches because a particular input port can only be switched to an output port with the same wavelength group. One of ordinary skill in the art would have been motivated to combine the teaching of Fatehi et al. with the switching system of Shiragaki because using a plurality of small WSXCs is more reliable and more cost effective than using a large complex switch. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a plurality of small switches, as taught by Fatehi, to replace the large switch of Shiragaki in the switching system of Shiragaki because using a plurality of small WSXCs is more reliable and more cost effective than using a large complex switch.

Regarding claims 33-34, the difference between Shiragaki and the claimed invention is that Shiragaki does not teach inclusion of optical amplifier for compensation for losses. Fatehi et al. teaches in col. 9, lines 34-36 the use of optical amplifier for compensating losses. One of ordinary skill in the art would have been motivated to combine the teaching of Fatehi et al. with the switching system of Shiragaki because compensating losses with optical amplifier equalizes the

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intensity level of all the channels in a WDM system and improves the quality of the signal. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use optical amplifiers to compensate losses, as taught by Fatehi et al., in the switching system of Shiragaki because compensating losses with optical amplifier equalizes the intensity level of all the channels in a WDM system and improves the quality of the signal.

Allowable Subject Matter

9. Claims 2-16, 18-26 and 35-36 are allowed.
10. Claim 38 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

11. Applicant's arguments with respect to claims 27-34 have been fully considered but they are not persuasive.

The Applicant argues that Shiragaki does not teach logical layer for switching optical channels or a group of optical channels. Rather, any reference to switching in Shiragaki is purely from a physical standpoint. However, the Examiner finds that the wavelength switch 13 of Shiragaki is patentably equivalent to "first logical layer" of claim 27 and the space switch 10 is patentably equivalent to "second logical layer" of claim 27. The wavelength switch 13 of Shiragaki switches optical channels and the space switch 10 of Shiragaki switches a group of optical channels. They perform the same functions as the first logical layer and the second logical layer, respective, of claim 27. The word "logical" in claim 27 does not carry any patentability

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weight because it is related to an abstract concept that is not tangible and, therefore, is not enforceable.

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shi K. Li whose telephone number is 703 305-4341. The examiner can normally be reached on Monday-Friday (8:30 a.m. - 5:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 703 305-4729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

skl


LESLIE PASCAL
PRIMARY EXAMINER